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This paper described an interdisciplinary course on the interaction between prejudice and the conduct of science. Scientists often possess the same prejudices as others in their culture. Students learn how subtle prejudice can affect the processes of science. This course examines major scientific endeavors that have been influenced by the prejudices of society and served to "justify" those prejudices. The measurement of racial differences in human intelligence, the study of sexual orientation, and the study of gender differences all illustrate how biases and assumptions have led scientists to misinterpret or even falsify data. (Author)

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Incorporating Psychology into an Interdisciplinary Course on Science and Prejudice

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Presented at the 100th Annual Convention of the American Psychological Association

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Abstract

This paper describes an interdisciplinary course on the interaction between prejudice and the conduct of science. Scientists often possess the same prejudices as others in their culture. Students learn how subtle prejudice can affect the processes of science. This course examines major scientific endeavors that have been influenced by the prejudices of society and served to "justify" those prejudices. The measurement of racial differences in human intelligence, the study of sexual orientation, and the study of gender differences all illustrate how biases and assumptions have led scientists to misinterpret or even falsify data.

This paper describes a course titled "Tarnished Truths: Prejudice in Science and Society," offered as an interdisciplinary course in the "Liberal Studies IV" Program at Skidmore College. Faculty develop courses in this program "to examine the interactions between scientific or mathematical inquiry and the society in which such inquiry takes place." I developed this particular course to examine the self-perpetuating nature of prejudice as it occurs in the conduct of science. Scientists, as human beings, possess the same social stereotypes and prejudices as other people in the culture in which they exist. However, scientists also are perceived (by themselves and others) as being objective and "above" the influence of prejudice. The idea that anybody can escape the influence of prejudice is partially based on a misconception of what prejudice actually is. In the popular mind, prejudice is synonymous with blatant racial hatred, discrimination, and violence. Most people do not perceive the scientific community as displaying such behavior. Therefore, so the reasoning would go, prejudice does not influence the conduct of science, except perhaps in such obvious cases as the "science" of Nazi Germany. This course attempts to change these misconceptions. Students are taught that science is a "human process" of interpreting and organizing information, and this process is subject to subtle forms of prejudice. Science may then seem to "justify" the prejudice. Thus, the course emphasizes the interaction between science and society in perpetuating prejudice (see Fig. 1).

Unfortunately, research into the psychology of prejudice indicates that blatant "old-fashioned" prejudice represents only a part of the phenomenon of prejudice, a part that is increasingly hidden in modern society because norms do not permit the display of blatant prejudice. However, research has also revealed that more subtle forms of prejudice remain and can be as dangerous as the more blatant forms, perhaps even moreso because of their invisibility. Subtle prejudice is revealed in two major approaches to the study of prejudice. The "motivational" approach examines the racial ambivalence that occurs as people try to reconcile two major values of our culture, egalitarianism and the protestant work ethic. The result is a form of prejudice that reveals itself only under circumstances where discriminatory

actions can be "justified" on nonprejudiced grounds. The "cognitive" approach takes prejudice out of the realm of the dysfunctional, and places it squarely in the context of the normal cognitive processes by which we organize our perceptions. We use heuristics to simplify our social world, and biases occur as a natural result of this process. A major implication of this approach is that people may become more aware of their biases and act to overcome them, but the biases themselves cannot be eliminated. By helping students become more aware of these subtle forms of prejudice, they can also be helped to appreciate how these same biases can affect the processes of science. In effect, this course shows how the scientific study of prejudice helps us to understand the ways in which prejudice affects science itself.

Students learn how science may perpetuate the very prejudices that influenced the conduct of the science in the first place. This is particularly true in the fields of biology and psychology, which are expected to reveal the nature of humans as both body and mind. A major component of this course is the examination of major scientific endeavors that have been influenced by the prejudices of society and served to justify those prejudices. The first of these endeavors was the measurement of human intelligence. Both biologists, in their desire to establish a biological basis for individual differences in intelligence, and psychologists, in their desire to find a single number that would indicate general intelligence (IQ), interpreted their results in such a way as to support "biological determinism" and the notion that races could be ranked on intelligence. Stephen Jay Gould's The Mismeasure of Man details both subtle and flagrant ways in which these results were biased. One fallacy that Gould uncovers is the notion that diverse entities can be "ranked" in any meaningful way. Accompanying materials include an exercise developed for this course that demonstrates the fallacy of "ranking."

Students also consider biases in the study of gender differences in psychology. This area of research, fraught with subtle biases, has nevertheless been an important factor perpetuating sexist stereotypes and behaviors. The final scientific endeavor discussed is the study of sexual orientation, which was influenced by the prejudgments of psychologists and psychiatrists in

such a way as to assure the continuation of the notion of homosexuality as a mental illness.

In each of these examples, it is possible to clearly delineate the biases and assumptions that led scientists to misinterpret or even falsify their data, and it is equally possible to show how the conclusions had an impact on society. To make this latter point, students study the effects of prejudice on society's oppressed. Readings dealing with black psychology or the experience of being gay help students understand how prejudices perpetuated by science have an impact on people living in society. This course also points out how the understanding of prejudice developed from social psychological research has led to the development of techniques for decreasing prejudice in society.

Although biology, history, philosophy of science, sociology, and anthropology are all part of this course, psychology is central to an understanding of how scientists, as humans, are subject to the same prejudices as others. Students learn that science is indeed a human endeavor. Psychology is also incorporated throughout this course to illustrate the care that must be taken to ensure that science does not become an accomplice to society's prejudices. Whether considering the measurement of intelligence or search for gender differences, students learn that "numbers are only numbers" unless scientists and society use (or misuse) them to place limits on people because of their race, gender, or other characteristics.

Selected Readings, Activities, Assignments, etc. on Prejudice and Science

I. What is prejudice?

"Terror in our Neighborhoods" a special report by the Klanwatch Project (205)264-0286

Shenk, D. (February, 1990) "Young Hate," CV, pp. 34-39.

Allport, G.W. (1954). "What is the problem?" in The Nature of Prejudice, Addison-Wesley, pp. 3-16.

Aronson, E. (1988). "Prejudice" in The Social Animal, Fifth Edition, pp. 229-283.

"How common is prejudice?" USA Weekend Special Report on civil rights, June, 1991.

"The Changing Face of Prejudice" from "Prejudice" chapter in Social Psychology, by David O. Sears et al.

"The Aversive Form of Racism" (pp. 61-66) by S. Gaertner and J. Dovidio, in Prejudice, Discrimination, and Racism.

II. What is the scientific process?

Kuhn, T.S. (1970). "Anomaly and the Emergence of Scientific Discoveries" in The Structure of Scientific Revolutions, University of Chicago, pp. 52-65.

Rothbart, M. (1981). "Memory processes and social beliefs" in Cognitive Processes in Stereotyping and Intergroup Behavior (D. L. Hamilton, Ed.), pp. 145-155.

Exercise: Eleusis - a card game designed to simulate and stimulate scientific thinking, from Activities Handbook for the Teaching of Psychology, Vol. 2, APA, pp. 12-15.

II. How has science influenced, and been influenced by, society's views of....

A. Europeans and Euro-Americans, Native Americans, Africans and African-Americans?

Helmreich, W.B. (1982). "All about Stereotypes" and "Are Stereotypes Valid?" in The Things They Say behind your Back, Doubleday. In addition, students selected one of five chapters on specific groups (Jews, Blacks, Japanese, WASPS, or Hispanics) to read and present in small groups.

Gould, S. J. (1981). The Mismeasure of Man, Norton. (except for Ch. 6)

Exercise: The "art" of Ranking (see attached)

Mander, J. (Nov./Dec., 1991) "What you don't know about Indians," Utne Reader, pp. 67-74.

Assignment: seek out information on Native American issues

Video: "In the White Man's Image" from The American Experience, documents efforts to assimilate Native Americans into the Euro-American culture.

Fox, R. (1970) "Chinese have bigger brains than whites - are they superior?" in Prejudice and Race Relations, Quadrangle Books, pp. 18-34.

Video: "Eye of the Storm"

Dove, A. (July, 1968) "Taking the Chitling Test," Newsweek, pp. 51-52.

Assignment: paper on "limits" (see attached)

B. women and men?

Tavris, C. (1991). "The Mismeasure of Woman: Paradoxes and Perspectives in the Study of Gender" in Psychological Perspectives on Human Diversity in America. APA, pp. 89-136.

Assignment: paper on co-ed vs. single-sex colleges (see attached)

Video: Gender: The Enduring Paradox from "Smithsonian World." A journey into American culture to explore the everchanging role of gender in American society.

"Re-examining Abortion: Has modern medicine changed the debate?" Utne Reader, March/April 1991, pp.

52-65.

Crosby, F. & Blanchard, F. (1989). "Introduction: Affirmative Action and the Question of Standards" in Affirmative Action in Perspective, Springer-Verlag. (available from SPSSI)

Audiotape: "Affirmative Action: Applying What We Know to Promote Justice" Faye Crosby. (APA, 1990).

C. gay men, lesbians, and heterosexuals?

McNaught, B. (1978). "On Being Yourself " in A Disturbed Peace, Dignity, pp. 1-30.

Blumenfeld, W.J, & Raymond, D. (1988). "Prejudice and discrimination" and "What causes homosexuality?" in Looking at Gay and Lesbian Life, Philosophical Library.

Video: "Times of Harvey Milk" follows Milk, first openly gay activist elected to public office in America, from his early days to his murder in 1978, and relates these events to the ongoing movement for gay rights in the United States. Academy Award Winner: "Best Documentary"

Boswell, J. (1981). "Introduction" in Christianity, Social Tolerance, and Homosexuality: Gay People in Western Europe from the Beginning of the Christian Era to the Fourteenth Century, University of Chicago Press, pp. 3-30.

Video: "Before Stonewall: The Making of the Gay and Lesbian Community"

Gelman, D. (Feb. 24, 1992) "Born or Bred" Newsweek , pp. 46-53.

Assignment: apply Rothbart's analysis to issues addressed in the course (see attached)

Exercise: The "art" of Ranking

In Ch. 1 of The Mismeasure of Man, Gould claims that two fallacies are central to the arguments supporting biological determinism: reification and ranking. Reification refers to our propensity to turn complex abstract concepts into real unitary "things." Thus, a complex set of human capabilities becomes reified as "intelligence." Once reified into a single entity, any concept becomes potentially measurable and variation can then be ranked along some kind of continuous scale (as when people are ranked from higher to lower intelligence). Today's exercise is designed to help you understand in a concrete way some of the pitfalls and problems of ranking. In this exercise, you will work in small groups to rank a number of items from highest to lowest. We will then discuss issues that arise in carrying out this process.

Each group will receive a set of numbered construction-paper figures. Your job is simply this: rank them. Come up with an ordered set of numbers that reflects your ranking of these figures on some physical characteristic. You may select any characteristic you like, but you must be able to justify your ranking on the basis of some measurable characteristic. In addition, you may also divide your figures into categories if you wish. There will be rulers, calculators, and a color spectrum available for your use.

Discussion:

Do the rankings differ for different groups? Why?

Suppose that you started by wanting a particular piece of paper to rank the highest. Do you think that you could devise a way of ranking the pieces so that your choice would come out on top?

What could be some different uses for these pieces of paper?

Are pieces that you ranked higher necessarily better for these uses?

Was the characteristic you chose as a basis for ranking really a single "thing" or more complex?

Can we make analogies between this exercise and the reification of intelligence and ranking of people?

(Note: To do this exercise, each small group is given an identical set of about a dozen construction-paper cut-outs in various colors, shapes such as triangles, rectangles and circles, and sizes, with each piece numbered. When they have finished creating their rankings, groups can put their rankings on the chalkboard for comparison.)

Writing Assignment

In The Mismeasure of Man, Gould suggests that measures of intelligence have been misinterpreted as indicating the limits of human potential, rather than providing guidance to those areas in which individuals could benefit from special assistance in developing their potential (see, for example, pp. 152-153 or p. 159). Based on this notion of "limits," immigrants were turned away, soldiers were denied promotion into the ranks of officers, and racial and ethnic groups were dismissed as incapable of benefitting from a proper education.

In this assignment, I would like you to explore in some personal and creative way the effects of "limits" on human potential. People respond in various ways to limits. Limits can become reality, and potential may go unfulfilled. Limits may also be overcome. We must understand both responses to fully grasp the social ramifications of limits. What are the effects of being deemed "incapable" of reaching certain goals? How are people's aspirations diminished by such limits? What leads other people to overcome limits? How is society affected either way? How have you personally been affected by any limits imposed in your life? In short, I would like for us as a class to think about and relate to the power of limits on both individuals and society. As your contribution to exploring this issue, you may consider some of the following possibilities:

1) Write a work of fiction (prose, poetry, or perhaps even a short play), and provide analysis of how it explores "limits."

2) Report on some personal experience involving "limits."

3) Report on an interview (e.g., with a handicapped person, with a relative or acquaintance who may have been an immigrant to this country, or any person who has experienced limits on their potential, either real or socially imposed).

4) Prepare a paper based on materials you might find in our library:

a) Look at how educators have viewed the limits of children, currently or in the past.

b) Examine some historical episode in which people have faced limits and what responses resulted.

c) Look for biographical information on a person who had to deal with limits.

d) See what psychologists have learned about people's responses to limits (e.g., learned helplessness or self-fulfilling prophecies).

e) Analyze some piece of literature that would be relevant to this topic.

Note that these ideas are meant to be suggestions only, and are not meant to "limit" your own possibilities for ways to creatively address this issue! Whatever you choose to do, however, you should make it clear how you see this as relating to the social consequences of limits as viewed in the context of this class. In other words, make clear connections back to consequences of limits discussed in Gould. You should produce a paper which is neatly typed, double-spaced, and grammatically correct (unless deliberately nongrammatical for a special purpose). Length should be appropriate to your approach (but 4 pages minimum). Be sure to reference any materials taken from other sources. In looking at papers, I will be looking for creativity, insight, how well the paper addresses the assignment, and care in preparation.

Writing Assignment

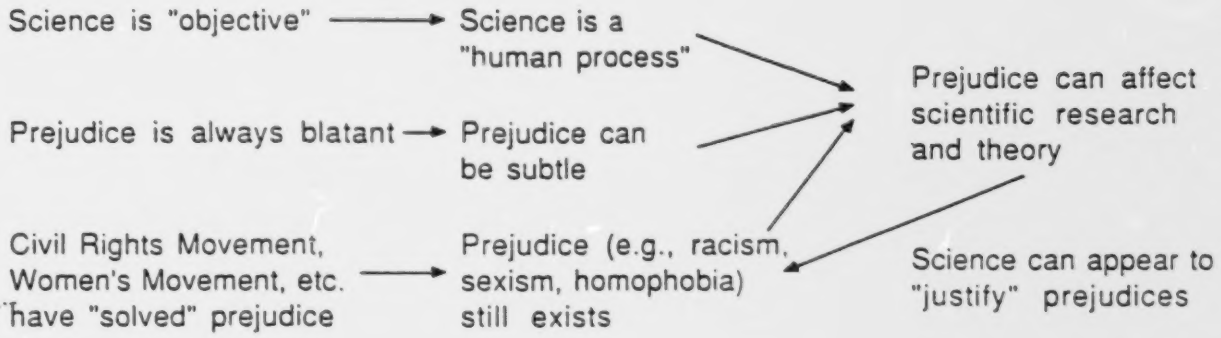
Many women's colleges have become co-ed over the past few decades, amid considerable discussion of the value of single-sex vs. co-educational institutions for women. For this assignment, I want you to adopt a position either for or against the value of women's colleges and support your position with material from Carol Tavris' article "The Mismeasure of Woman." I don't care which position you take. You will be graded on how coherently you support whichever position you take, making effective use of material in the article. You should definitely make use of ideas and research that have emerged from the transformation framework. (Especially pertinent would be findings regarding women's behavior in varying contexts, since here you will be comparing the value of placing women in contexts with or without male peers.) Other findings cited in the article may be useful as well.

Final Writing Assignment

To complete this assignment, you will first need to go back and review the reading by Myron Rothbart ("Memory Processes and Social Beliefs" on reserve). Recall that in that article, Rothbart distinguishes between the Context of Discovery and the Context of Proof, saying that, "One of the first requirements of scientific inference is a strict separation between the formation and verification of hypotheses. (p. 147)" Rothbart also says that, "Scientific thinking is idealized in these pages, and the behavior of living and breathing scientists frequently deviates from the ideal; certainly there is an abundance of evidence indicating that scientists are highly susceptible to common biases and illusions in thought. (p. 146)" In essence, everything we have done since in this class has focused on looking at this "abundant evidence" with regard to scientists studying intelligence, gender differences, and sexual orientation.

For this assignment, you should carefully examine the 5 steps (e.g., "1. Define the Appropriate Sampling Domains") in Rothbart's Context of Proof and consider how scientists that we have studied have deviated from these ideals. Select 3 of these steps to write about. For each of these steps, do the following. First, state what step you are addressing and briefly explain what it means, and what would constitute a "deviation" from this ideal. Then give specific examples of deviations from the ideal in the scientific studies that have been discussed in readings for this class. If possible, you should give 1 or 2 examples from each of the areas of study we have examined (i.e., intelligence, gender, sexual orientation). For each example, cite your source, explain how the research deviated from the ideal, and how this affected the conclusions drawn from the research.

Figure 1 Schematic of Course Goals


Misconceptions
Reality
Science is "objective"
Science is a "human process"
Prejudice is always blatant
Prejudice can be subtle
Civil Rights Movement, Women's Movement, etc. have "solved" prejudice
Prejudice (e.g., racism, sexism, homophobia) still exists
Prejudice can affect scientific research and theory
Science can appear to "justify" prejudices